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# ZEISS

# OPTICAL

## INSTRUMENTS for Scientific and Technical Investigations



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CZ 99-036a-2

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## Meeting the most exacting demands of science and industry

we offer:

Microscopes

Photomicrographic Outfits

Epidiascopes

Optical Instruments for

Measuring,

Indicating Recording

and Examining Purposes.

Unexcelled for performance and workmanship, practicability of design and elegance of outline. — The result of a century of experience and tradition.

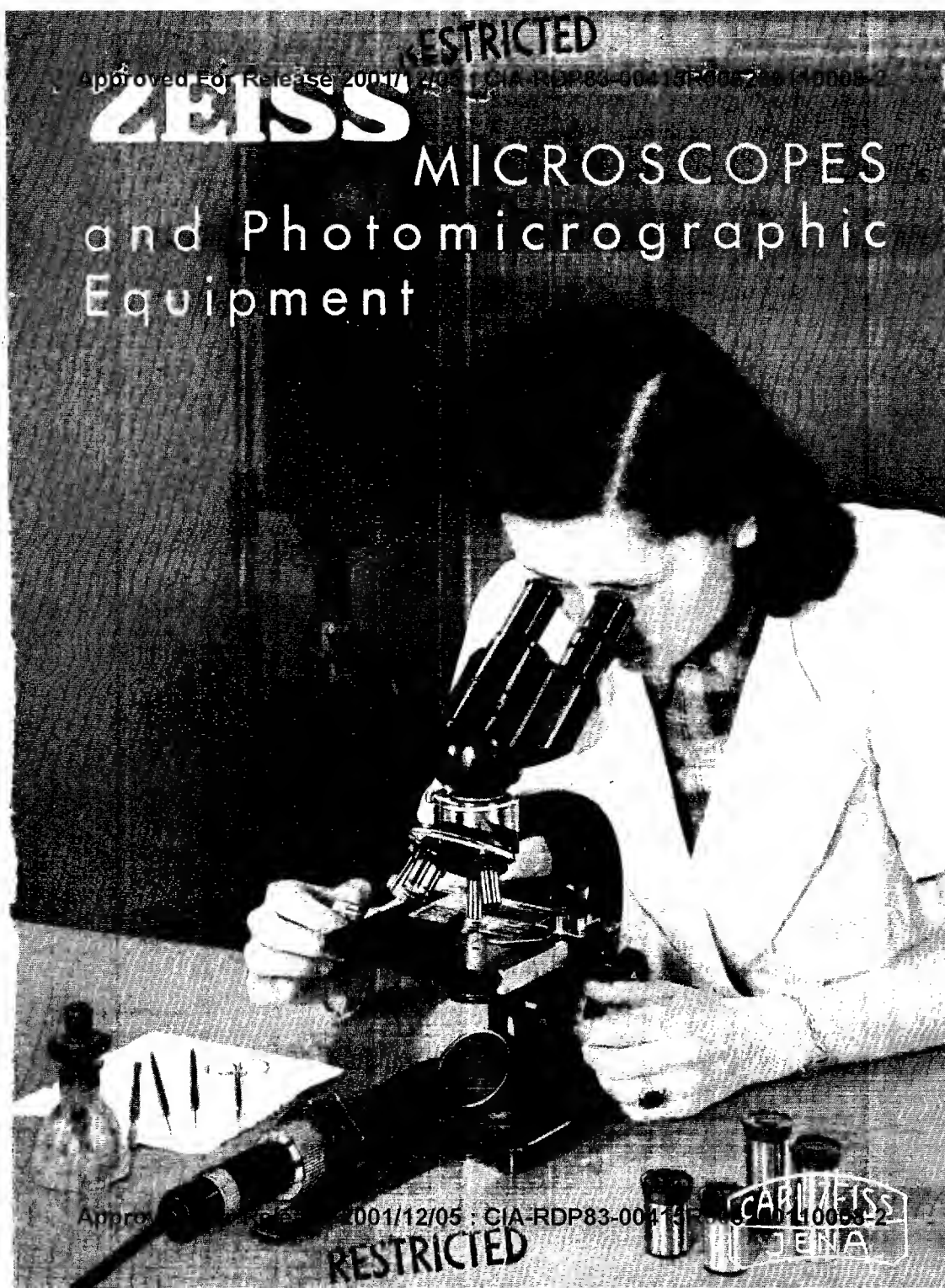
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# ZEISS

## MICROSCOPES and Photomicrographic Equipment



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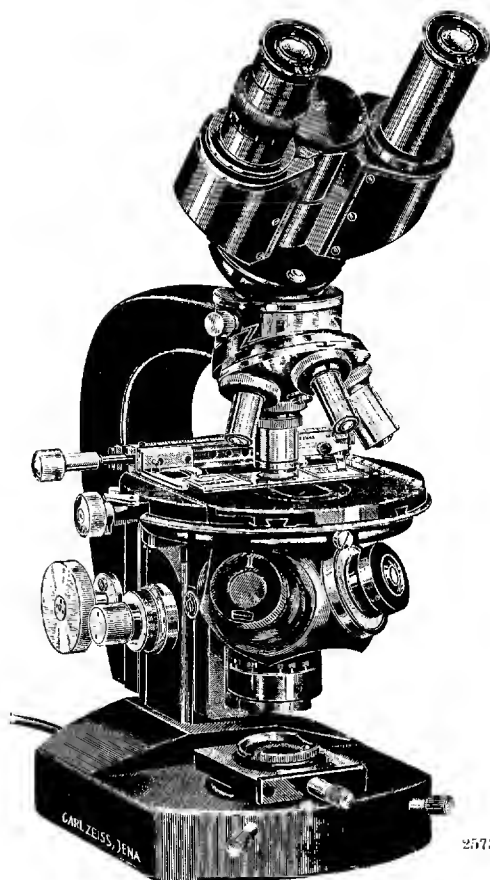
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## Large Research-Microscope "Lumipan"

with built-in illuminant



Fig. 1 (about 1/3 actual size)



**Stand Lp** for comfortable inclined observation and with quick tube changing device, coarse and slow motions below stage level, Substage with pancreatic condenser system (both with "T" — coated optics) for microscope objectives with apertures from 0.16 to 1.40, aplanatic condenser 1.4; Cardioid condenser for dark field illumination and condenser for low power objectives in a new type of triple condenser turret, large mechanical stage E (75 x 50 mm. movement); in cabinet with lock and key (not including electrical accessories, cf. p. 10).

Monocular inclined tube L  
Binocular inclined tube attachment "Bitukni L" with coated optics, primary magnification  $\times 1.5$   
Quadruple nosepiece on slide  
Apochromats 10/0.30 and 20/0.65  
Apochromat 60/1.00 with iris diaphragm, homogeneous oil immersion (also for dark ground work)  
Apochromat 90/1.30, homogeneous oil immersion  
Compensating paired eyepieces  $\times 5$ ,  $\times 7$  and  $\times 10$   
Compensating eyepiece  $\times 15$

**Microscope LpE "Lumipan"** equipped as above for magnifications from  $\times 50$  to  $\times 1350$

Order number	Code word
30 00 40	Ksthf

**Microscope LpG "Lumipan"**, same as above (Ksthf), but with square mechanical stage "G" 75 x 50 mm. range of movement . . .

Order number	Code word
30 00 41	Kycju

For further details cf. "CZ 30 126a"

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## Large Universal Research Microscope Lu Wd E

with vertically adjustable stage



**Stand Lu** for comfortable inclined observation and with quick tube changing device, coarse and fine motions below stage level, interchangeable Abbe substage Wd with diaphragm carrier and laterally adjustable and rotatable iris diaphragm, interchangeable stage carrier with large mechanical stage E (75 x 50 mm. movement) for vertical adjustment, in cabinet with lock and key.

Binocular inclined tube L with coated optics,  
primary magnification  $\times 1.5$   
Condensor 1.2  
Quadruple nosepiece on slide  
Achromats 8/0.20 and 20/0.40  
Achromat 40/0.65

**Binocular Universal Microscope Lu Wd E** equipped as above for magnifications  $\times 60$  to  $\times 1350$

**Binocular Universal Microscope Lu Wd G**, as (K $\ddot{y}$ aer) but with square stage "G"

For monocular observation:

**Monocular inclined tube L**

**Compensating eyepiece  $\times 15$**

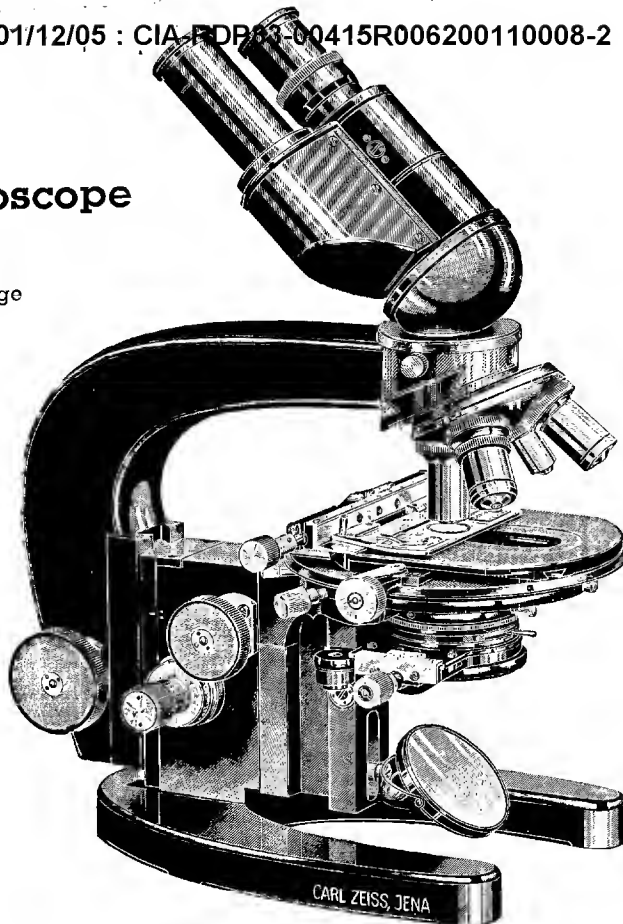


Fig. 2 (about  $\frac{2}{3}$  actual size) 25079

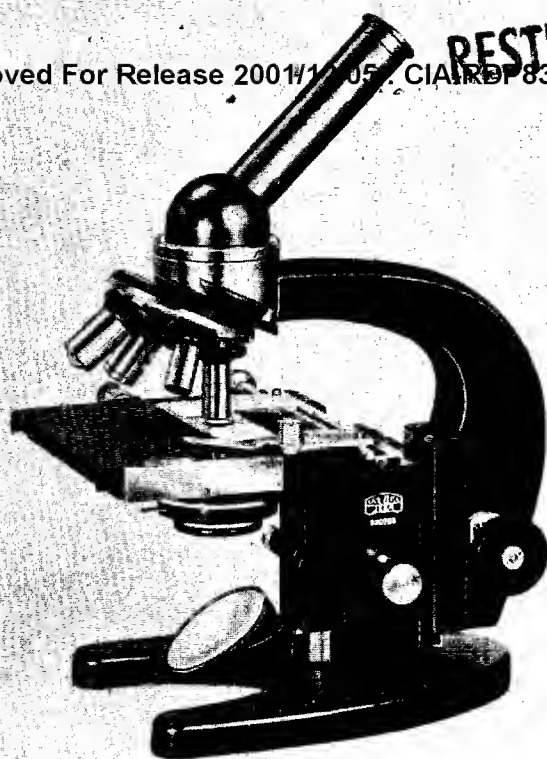
Achromat 90/1.25 homogeneous oil immersion with iris diaphragm (also for darkfield observation)

2 Huygens eyepieces  $\times 5$   
2 Huygens eyepieces  $\times 7$   
2 Huygens eyepieces  $\times 10$

Order number	Code word
30 00 32	K $\ddot{y}$ aer
30 00 33	K $\ddot{y}$ a $\ddot{y}$ s
30 50 01	K $\ddot{y}$ nywa
30 31 23	K $\ddot{y}$ onap

Thanks to the vertical adjustability of the stage stand Lu, if complemented with an Epi-condensor, may be used with advantage for observations by incident light. Please apply for particulars.

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# **Monocular General Purpose and Diagnostic Microscope Lg OG**



Fig. 3 (about 2/3 actual size)

300015

**Stand Lg** for comfortable inclined observation and with quick tube changing device, coarse and fine motions below stage level, rack and pinion adjustable sub-stage O, square mechanical stage G, in cabinet with lock and key.

Monocular inclined tube L  
Condenser 1.2 with iris and filter holder  
Quadruple nosepiece on slide  
Achromats 8/0.20 and 40/0.65

Achromat 90/1.25, homogeneous oil immersion<sup>1)</sup>  
Huygenian eyepieces  $\times 7$  and  $\times 10$   
Compensating eyepiece  $\times 15$

**Microscope Lg OG** equipped as above for magnifications from  $\times 56$  to  $\times 1350$

**Microscope Lg OE**, same as above (*Kyaob*) but with large mechanical stage E (Fig. 1) in place of square mechanical stage G

**Microscope Lg OB**, same as above (*Kyaob*) but with simplified rotatable mechanical stage B (cf. Fig. 4)

Supplementary Equipment:

**Binocular tube attachment "Bitukni L"**, with coated optics primary magnification  $\times 1.5$  (requiring one more Huygenian eyepiece each  $\times 7$  and  $\times 10$ )

**Simplified attachable stage** in case (for Lg OB)

**Cardioid dark field Condenser 1.05** with centring device, in case For microscope lamp cf. p. 10

<sup>1)</sup> For dark-ground work the achromatic objective 90/1.25 (homogeneous oil immersion) is supplied with iris diaphragm

Order number	Code word
30 00 18	<i>Kyaob</i>
30 00 17	<i>Kybo</i>
30 00 16	<i>Kybal</i>
30 50 00	<i>Knyyc</i>
30 51 10	<i>Kudty</i>
30 43 10	<i>Kovuc</i>
	additional codeword
—	<i>Kybep</i>

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## "Standard" Vertical Camera

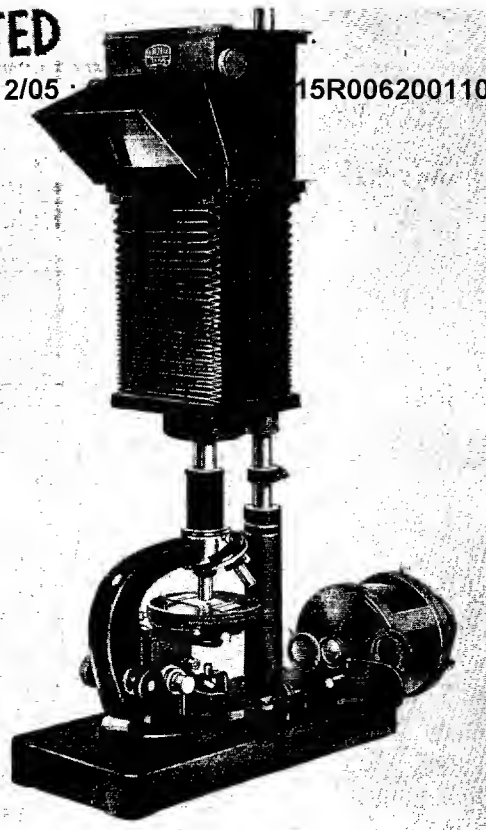


Fig. 4 (about  $\frac{1}{6}$  actual size)

300025

Simple and rapid operation, remarkable versatility and maximum performance in the various fields of photomicro- and macrography are the salient features of this apparatus. By detaching the camera from the microscope the operator is in a position of employing any type of microscope available for photomicrographic purposes and to complement his outfit according to requirements.

**Vertical Camera "Standard 9 x 12" with illuminating device;** consisting of base plate with column, extensible swing-out camera; 2 metal plate holders, one each frosted and clear glass screen, light-protecting sleeve, lamp housing and holder for filter 32 mm.  $\varnothing$ ; shutter and an additional filter holder, light-tight connecting sleeve, focusing magnifier  $\times 6$ ; protective filter (neutral glass), and reflector attachment (not including microscope and electrical accessories).

**Accessories:**

**Trichrome filter** (1 yellow glass and 1 blue glass 32 mm.  $\varnothing$ )

For macro work:

**Focusing mount** for objectives with iris diaphragm for screw-on attachment to front panel of camera

**Tessar 1:4.5 f = 13.5 cm.** with coated optics, in special mount

Electrical accessories:

**Projector bulb 12 V. 100 W.**

**Transformer** with cable for 220 V. a. c.

Order number	Code word
30 60 60	Kwiya
30 46 45	Pjang
30 86 40	Penaa
54 06 01	Kwoht
2544 ZN 54	Pekru
05 85 30	Pekxa

For further details cf. "CZ 30-615 a"

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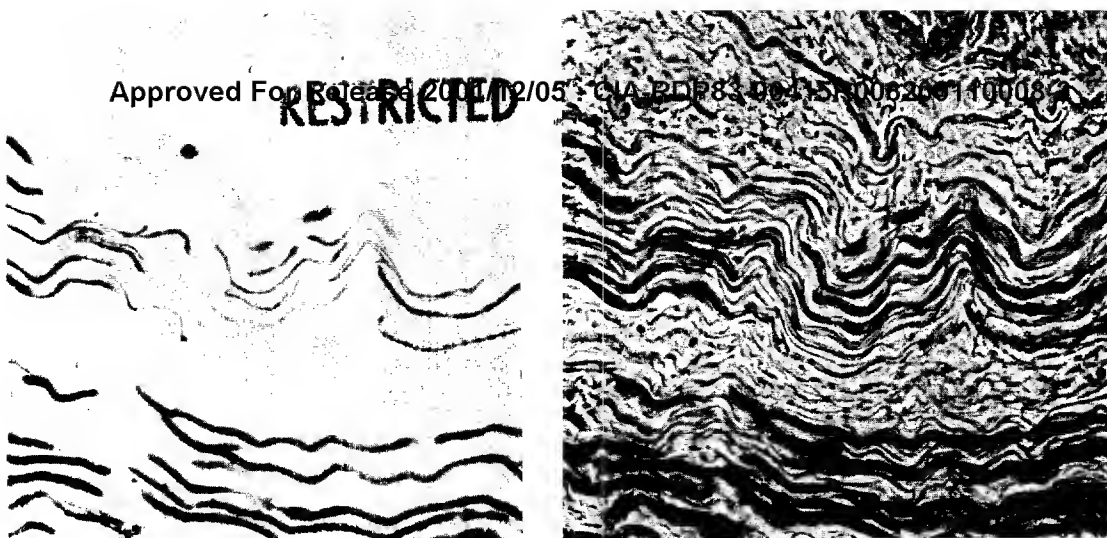


Fig. 5

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Longitudinal section of Human Peripheral Nerve (in connective tissue degeneration).  
Left: bright field Right: phase contrast

**New possibilities of observation in microscopy by means of the**

## **Zeiss-Phase Contrast Method**

The new phase contrast method after Zernike offers valuable assistance to science in general and to biological, bacteriological and diagnostic research in particular in that it permits the observation of biological processes which were not demonstrable heretofore. This applies especially to unstained living microscopic objects which can now be observed and photographed with a distinctness unobtainable in the past. The special type of objectives designed for phase contrast equipment are also available for the conventional microscopic observation of stained specimens in bright and dark ground illumination.

### **Components:**

Achromatic Objective Ph 10/0.30  
Achromatic Objective Ph 20/0.40  
Achromatic Objective Ph 40/0.65  
Achromatic Objective Ph 90/1.25 (homog. oil immersion)  
Yellow/Green Filter  
Phase condenser with auxiliary microscope in case  
(for the conventional types of microscopes)  
Annular diaphragm in mount and auxiliary  
microscope (for "Lumipan")

### **Complete Equipment:**

#### **Phase Contrast Equipment for the conventional types of microscopes\*)**

Consisting of: Phase condenser with auxiliary microscope,  
Yellow/Green Filter and four Phase contrast objectives (as above)

#### **Phase Contrast Equipment for "Lumipan" Microscope**

Consisting of: Annular diaphragm in mount and auxiliary microscope,  
Yellow/Green Filter and four Phase contrast objectives (as above)

Order number	Code word
30 20 83	<i>Kusuk</i>
30 20 80	<i>Kusyo</i>
30 20 81	<i>Kutap</i>
30 20 82	<i>Kuteu</i>
30 46 26	<i>Pjapi</i>
30 43 40	<i>Kutoe</i>
30 40 27	<i>Kutka</i>
30 43 41	<i>Kycoz</i>
30 43 42	<i>Kyepa</i>

\*) The phase contrast equipment is adaptable to any make of microscope provided the diameter of the condenser sliding sleeve is not smaller than 36.8 mm. and that there is sufficient space for the revolving disc of the phase condenser (diameter 96 mm.).

For further details cf. "CZ 30-304 a".

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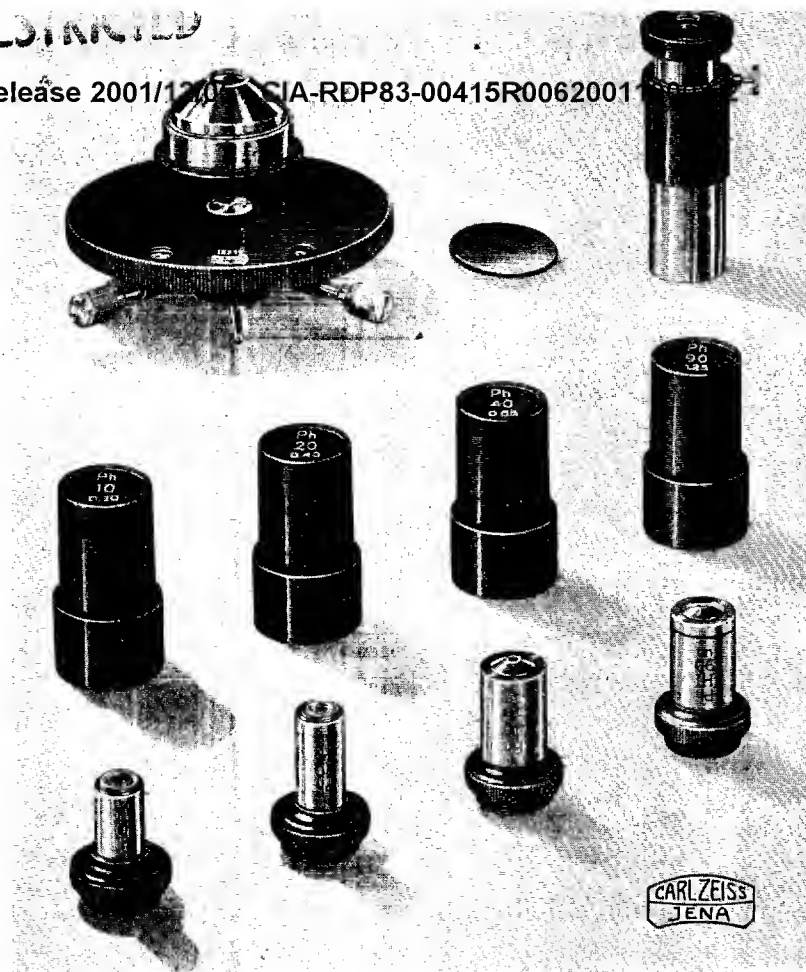


Fig. 6

300008

#### Components of Zeiss Phase Contrast Equipment

Top: Phase condenser, Yellow/Green filter and auxiliary microscope

Middle: Containers for objectives

Bottom: Achromatic Phase objectives

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**Microscope lamps**

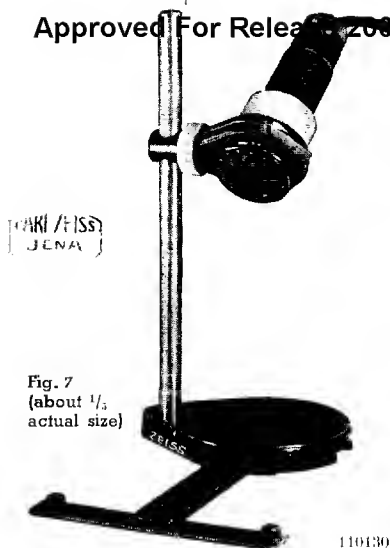


Fig. 7  
 (about 1/3  
 actual size)



Fig. 8 (about 1/3 actual size)

for bright and dark ground observations and for photomicrography; consisting of two-component collector with iris diaphragm and blue glass filter; guide tube for lamp cap with bayonet socket for bulb; 6 V. 15 W. bulb including cable and plug (not including filament lamp):

**Microscope lamp A:**  
 on connecting bar

**Microscope lamp B:** on vertical column, adjustable in height and inclinable, on pear-shaped base with connecting bar (Fig. 7)

Neutral glass

**Electrical accessories**  
 (required also for "Lumipan" (page 41))

Filament lamp 6 V. 15 W.  
 with clear glass bulb

Filament lamp 6 V. 15 W.  
 with satin-frosted calotte (for photomicrography)

220 V. a. c. transformer with flex and plug

**Microscope lamp C:** for bright field illumination only, mounted on oval base, with inclinable housing, including cable and plug, operable on service mains (not including accessories), cf. Fig. 8

**Accessories:**

Tubular bulb 110 V. 25 W.

Tubular bulb 220 V. 25 W.

Blue glass screen

Connecting bar to microscope

Order number	Code word
30 42 00	Kymuu
30 42 01	Kwyak
30 46 87	Kyaco
2613 ZN 54	Kwoim
2613 ZN54 ksm	Kwoko
05 85 26	Kwons
30 42 02	Kybiu
1211 ZN 54	Kyboa
1216 ZN 54	Kybmy
30 46 85	Kiwab
30 42 32	Kiwde

For further details cf. "CZ 30-350a".

## Polarizing filters

for insertion into the diaphragm carrier and filter holder of illuminants or condensers, or into the eyepiece cap. Their simple manipulation in conjunction with compensators make them excellently available for investigations in polarized light.



Fig. 9  
 (about 2/3 actual size)



Fig. 10  
 (about 2/3 actual size)

**Filter polarizer** (Fig. 9)

**Filter analyser** (Fig. 10)

Compensators in metal mount with handle

**Compensating plate sele-nite red I**

**Compensating plate 1/4 λ**  
 Indispensable if used on "L"-type stands;

**Straight monocular tube L**

Order number	Code word
30 59 00	Kimoz
30 59 10	Kimpa
30 59 70	Kimue
30 59 76	Kinku
30 50 04	Kobac

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### Objectives for microscopes

Systems	Notation		Focal length mm.	Free working distance mm.	Order number	Code word
	Primary magnification	Numerical aperture				
Achromatic objectives						
"Dry" series	3		36	29	30 20 02	Kohfb
	8	0.20	18	9	30 20 05	Kohok
	20	0.40	8.3	1.6	30 20 07	Kohrm
	40	0.65	4.4	0.55	30 20 08	Kohto
Homogeneous oil immersions	90	1.25	2.0	0.11	30 20 14	Koini
	90 *) with iris diaphragm	1.25	2.0	0.16	30 20 15	Koitr
Apochromatic objectives (for use only with compensating eyepieces)						
"Dry" series	10	0.30	16.2	5	30 20 51	Kogun
	20	0.65	8.3	0.7	30 20 52	Kogvo
Homogeneous oil immersions	60 *) with iris diaphragm	1.00	2.9	0.22	30 20 57	Kokha
	90	1.30	2	0.11	30 20 60	Kokoh

\*] Special objectives for dark ground observation which are also available for bright field work.

### Eyepieces for microscopes

Diameter of mount 23.2 mm.

Notation and Factorial Magnification	Focal length mm.	Field of view number	Order number	Code word
<b>Huygenian eyepieces</b> (for achromatic objectives of low and medium power)				
$\times 5$	50	23	30 31 01	<i>Komdu</i>
$\times 7$	36	18	30 31 02	<i>Komev</i>
$\times 10$	25	14	30 31 03	<i>Knurz</i>
<b>Orthoscopic eyepieces</b> (for achromatic objectives of low and medium power)				
$\times 12.5$	20	16	30 31 10	<i>Komiz</i>
$\times 17$	15	13	30 31 11	<i>Komja</i>
<b>Compensating eyepieces</b> (for all apochromatic and fluorite systems and for high power achromatic objectives)				
<b>K</b> $\times 5$	50	23	30 31 20	<i>Komst</i>
<b>K</b> $\times 7$	36	18	30 31 21	<i>Komuk</i>
<b>K</b> $\times 10$	25	13	30 31 22	<i>Komyo</i>
<b>K</b> $\times 15$	17	11	30 31 23	<i>Konap</i>
<b>K</b> $\times 20$	12.5	8	30 31 24	<i>Konbr</i>

### Micrometer eyepieces

Adjustable eyepiece H $\times 7$ (without micrometer)	30 31 05	<i>Kozei</i>
Adjustable eyepiece O $\times 17$ (without micrometer)	30 31 14	<i>Kozim</i>
Eyepiece micrometer, 10 mm. divided into 100 parts (tenths)	30 57 11	<i>Kraej</i>
Object micrometer, 1 mm. divided into 100 parts	30 57 20	<i>Krams</i>



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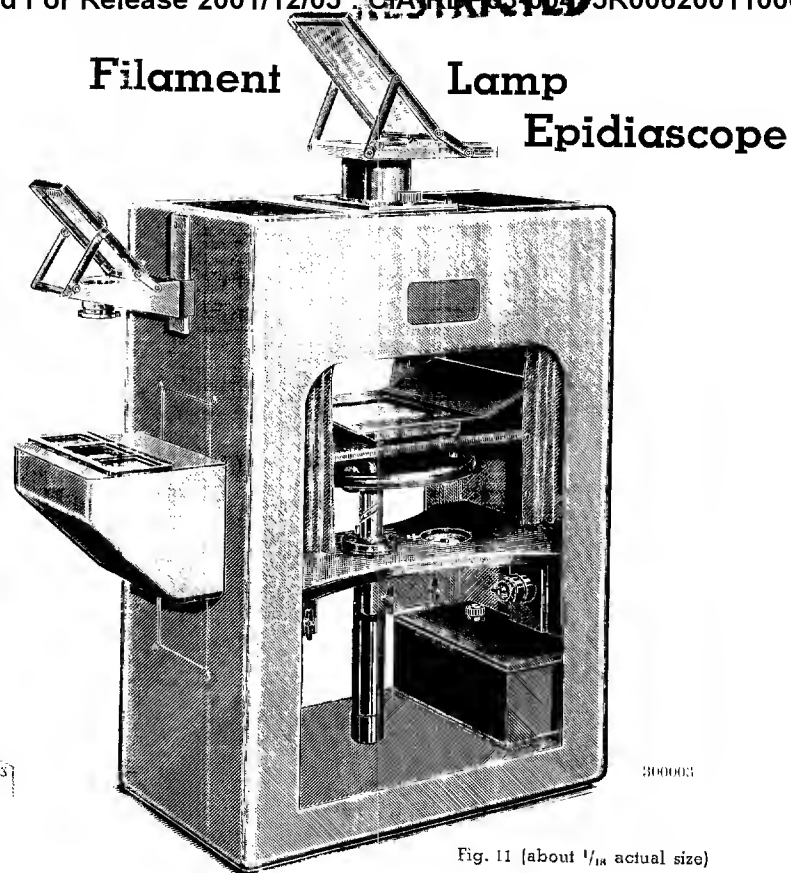


Fig. 11 (about  $\frac{1}{10}$  actual size)

The Filament Lamp Epidiascope provides an exceptionally bright and uniform illumination on the screen and projects objects of the most diverse character with striking distinctness. Equipped with high-aperture Epiotar objectives and a special type of illuminating mirrors, it operates on two 1000 Watt filament lamps and produces screen images of a most excellent luminous density. Glass filters of great heat-absorbing capacity ensure uninterrupted service and dispense with the noise of ventilator cooling systems. A convenient dimming switch eliminates irritating glare when inserting the objects. The Epidiascope can be conveniently operated from either side.

Additional features deserving emphasis are the pleasing design of the metal housing which moves on concealed rubber casters, and the small floor-space requirements ( $90 \times 52$  cm. -  $35 \frac{1}{2}'' \times 20 \frac{1}{2}''$ ).

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The Diascope projection arrangement fitted with a 500 W. bulb is permanently attached to the Epidiascope.

The Epidiascope is arranged for 220 V. alternating current, a built-in transformer permitting the use of 110-V. lamps which are known to yield the greatest illuminating effect.

## Technical Details

**Episcopic Projection:** Object stage  $58 \times 44$  cm. ( $22\frac{3}{4}'' \times 17\frac{1}{4}''$ ) with  $20 \times 20$  cm. field stop and convenient hand wheel control for the elevating pillar; dimming device with mercury switch; illuminating system in the upper part of the housing containing two 1000 Watt projection filament lamps in adjustable lamp-holders with large aspherical illuminating mirrors and heat-absorbing glass filters.

The top of the instrument houses the fine adjustment for the projection system; the hinged erecting mirror in dust-proof mount, and an adjusting screw controlling the inclination of the mirror.

**Diascopic Projection:** Illuminating system with 500-Watt projector bulb in special lampholder; two-component condenser; heat-absorbing glass filter; deflecting mirror; field lens on a level with the object stage and lantern slide changer in horizontal arrangement; lens carrier and surface-silvered erecting mirror, in dust-proof mount, with adjusting screw controlling the inclination of the mirror which latter is hinged to shut down into its mount.

### Filament Lamp Epidiascope

for projecting distances of from 4.5 to 6.5 m. with Epiotar lens 1:3.5  $f = 43$  cm. for episcopic work and Epiotar lens 1:4.5  $f = 21$  cm. for diascopic work including three lantern slide carriers each  $8\frac{1}{2} \times 10$ ,  $8\frac{1}{2} \times 8\frac{1}{2}$  and  $9 \times 12$  cm. including built-in transformer with cable for 220 V. a. c. (not including bulbs)

**Projector bulb 110 V. 1000 W.**  
(of which two will be required)

**Projector bulb 110 V. 500 W.**  
with special lampholder

Order number	Code word
58 52 13	<i>Kyaly</i>
2591 ZN 54	<i>Phdan</i>
2411 ZN 54	<i>Paucs</i>

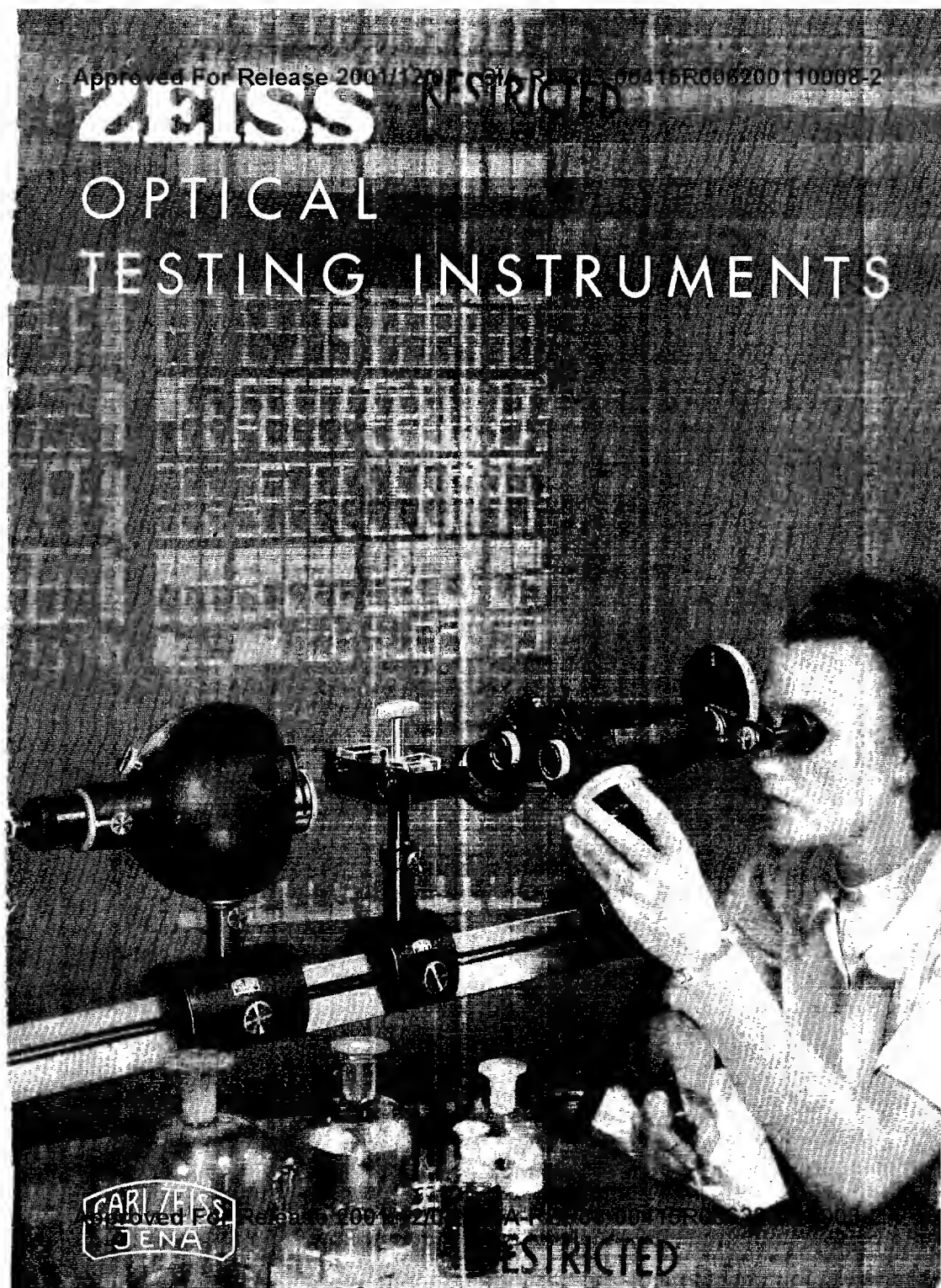
Please ask for special quotation if the above voltage and kind of current should not be available.

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# OPTICAL TESTING INSTRUMENTS



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In optical measuring instruments the physical laws of the manifold phenomena of light are utilized to meet the varied requirements of Science, Engineering and Industry.

Optical methods of measurement are characterised by:

- Narrow limits of error
- Rapidity of procedure
- Minimum consumption of substance
- Cleanliness and convenience

The properties of the substances under investigation are defined by:

- Refractive indices ( $n_D$ )
- Dispersion of colours
- Spectral emission and absorption
- State of polarization
- Fluorescence
- Extinction
- Brightness and transmission in general

Zeiss instruments have been material in promoting scientific research and industrial development. They are indispensable where demands are most exacting.

(C/K) / (1/155)  
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## Abbe Refractometer (Model G)



Fig. 12 (about 1/4 actual size)

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This instrument—which is known as the classical type of Abbe Refractometer—has been re-designed with the aim of adapting it to modern requirements. While fully preserving the Abbe principle of measurement the instrument has been given a more compact form besides imparting to it improvements affording the following advantages:

**Easier and consequently greater reading accuracy**  
**Dust-proof housing and full protection of measuring scale**  
**Handy location of motion control ensuring more convenient setting of the critical line.**

The Abbe Refractometer measures all kinds of solutions, fats and oils, including solid and plastic substances used in

**Chemical and Physico-chemical Institutes,**  
**Food Control Laboratories**  
**Industrial Laboratories**

**Measuring range:** Refractive index  $n_D = 1.3$  to  $n_D = 1.7$

Percentage of dry solids 0 to 85 %

**Tolerance:** Refractive index  $\pm 1$  to 2 units of the 4th decimal

Percentage of dry solids  $\pm 0.1$  to 0.2 %

**Abbe Refractometer, Model G**  
incl. thermometer 0–75° C., in wooden container

*Apply for particulars*

Order number	Code word
32 00 04	Ukumi

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## Dipping Refractometer

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Fig. 13  
(about  $\frac{1}{8}$  actual size)



16316

This instrument is used in testing the purity and determining the concentration of acids, bases, salts, alkaloids, foodstuffs as well as the proportion of albumen. Despite its utter simplicity in manipulation the Dipping Refractometer is known to furnish the most accurate readings of all refractometers and, as a consequence, enjoys an excellent reputation in the various provinces of medicine, chemistry and engineering.

**Measuring range:** When using 10 interchangeable  
prisms,  $n_D = 1.32539$  to  $n_D 1.64700$

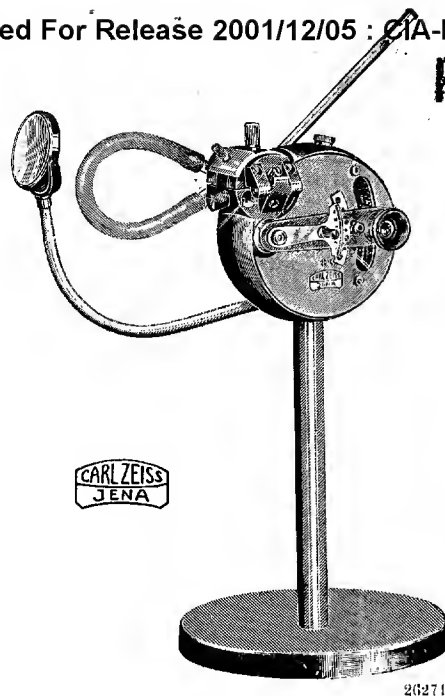
**Tolerance:**  $\pm 2$  units of the 5th decimal

**Dipping Refractometer:**  
Equipment for analytical laboratories  
with temperature regulating device C

Order number	Code word
32 01 00	Ujufa

For particulars cf. pamphlet "Mess 32-130-1"

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## Refractometer for Sugar and Oil Industries

Fig. 14  
(about  $\frac{1}{5}$ th actual size)

The most popular instrument in professional quarters for the rapid determination of dry solids and examination of the initial and final products in

### Sugar, Canning and Jam Industries

**Measuring range:** percentage of solids 0 to 95 %  
refractive index  $n_D = 1.330$  to  $n_D = 1.540$

**Tolerance:** solids  $\pm 0.1$  to  $0.2\%$   
refractive index  $\pm 1$  to  $2$  units of the 4th decimal

**Refractometer for the Sugar and Oil Industries**  
with thermometer 0 to  $50^\circ \text{C.}$ , in wooden box

Order number	Code word
30 02 50	Uctix

For particulars cf. pamphlet "Mess 32-140-1"

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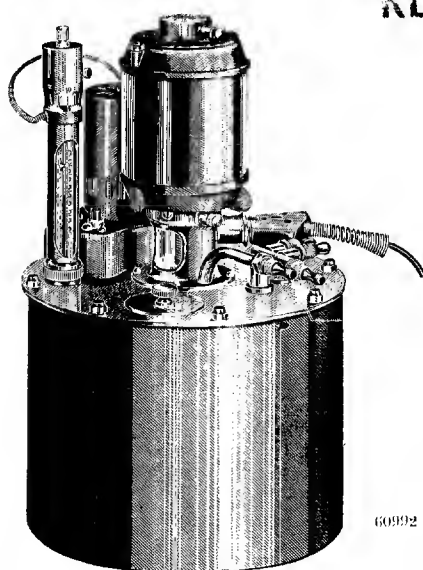


Fig. 15 (about  $\frac{1}{10}$  actual size)

## Ultra Thermostat

(Hoeppler type)

The maintenance of uniform temperature is a prerequisite for obtaining reliable refractometer readings. Meeting this condition the Ultra Thermostat of the Hoeppler type renders excellent service in the various branches of research. It automatically maintains the temperature at  $\pm 0.02^{\circ}\text{C}$ . for a range between  $-60^{\circ}$  to  $+250^{\circ}\text{C}$ .

**Ultra Thermostat**  
(Hoeppler type)  
with electro-thermometer  
0  $-100^{\circ}\text{C}$ . operating on  
220 V. a. c.

Order number	Code word
32 87 05	Uhxca

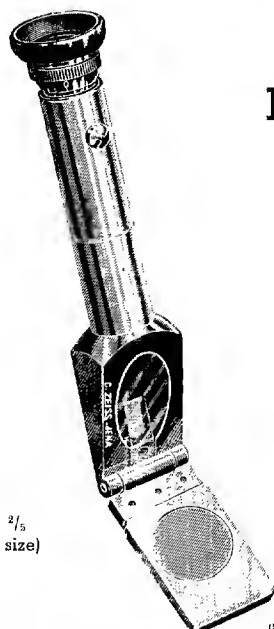


Fig. 16  
(about  $\frac{2}{5}$   
actual size)

## Hand Refractometer 0/30

A neat and very handy instrument rendering useful service in the determination of the percentage of solids within a range from 0 to 30% when testing fruit pulp in the jam production as well as when ascertaining the degree of ripeness in sugar beet, fruit and grapes.

**Tolerance:**  $\pm 0.2\%$

**Hand Refractometer 0/30**  
Equipment for beet sugar,  
in case

Order number	Code word
32 01 50	Ueruk

For particulars cf. pamphlet "Mess 32-145-1"

**RESTRICTED**

**Pulfrich  
Photometer  
(Equipment Ia/1)**



Fig. 17 (about 1/5 actual size)

for the measurement of reflection and transmission factors of solids, semi-solids, powders and of transparent materials used in

**Paper, Cellulose and Chemical Industries and Laboratories  
as well as in the production of photo-chemical papers  
(determination of density).**

**Pulfrich Photometer, Equipment Ia/1**

for reflection and transmission measurements of solid and semi-solid substances, operating on 220 V. alternating current

**Supplementary 1 to Ia/1**

for density measurements of photo-chemical papers

**Supplementary 2 to Ia/1**

for absorption measurements of transparent and translucent solids

*For particulars cf. pamphlet "Mess 32-535-1"*

Order number	Code word
32 50 00	<i>Ukupl</i>
32 50 03	<i>Ukunj</i>
32 50 05	<i>Ukufb</i>

**RESTRICTED**

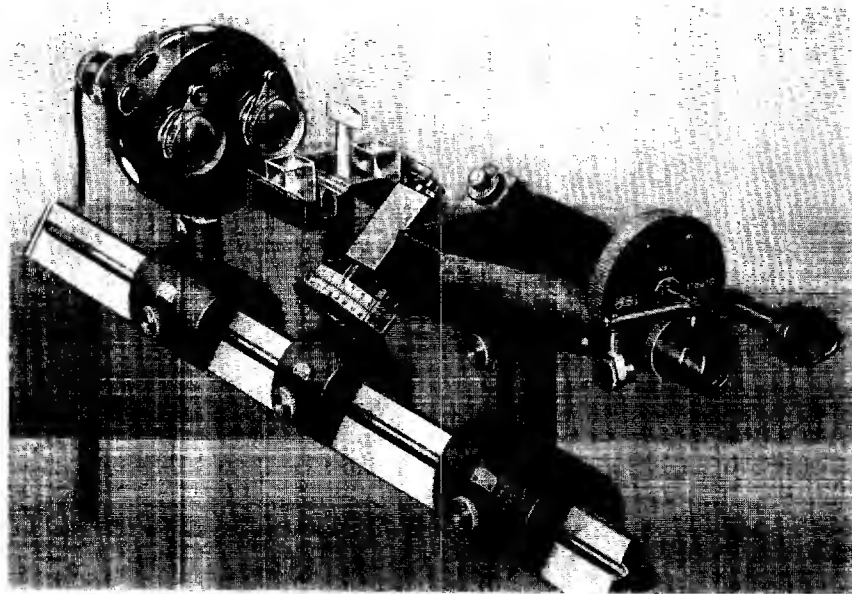


Fig. 18 (about 1/6 actual size)

320018

## Pulfrich Photometer (Equipment Ib/15)

for colorimetric determinations and absorption measurements of liquids in white and monochromatic light.

This equipment is used by:

**Chemical and Chemico-biological Laboratories, Clinical Laboratories, Chemico-agricultural Institutes and Food Control Offices**

for the colorimetric measuring of concentrations of physiologically important substances contained in blood, urine and liquor, as well as for the determination of vitamins, and in the testing of drinking water.

**Pulfrich Photometer, Equipment Ib/15**

for measuring normally absorbing liquids in white light, operating on 220 V. a. c.

**Supplementary 1 to Ib/15**

for measurements in monochromatic light

It is furthermore being employed by:

**Metallurgical Laboratories,  
Chemical Works and Dye Plants,  
Water Works,  
Sugar and Oil Refineries,  
Mills and Breweries**

for the colorimetric determination of the concentration of certain ingredients of the raw materials and final products, including purity tests of dyes, ascertaining the bleaching power of fuller's earths, and for water analysis, etc.

Order number	Code word
32 50 10	Ukign
32 50 12	Uktur

For particulars cf. pamphlet "32-515-1"

RESTRICTED

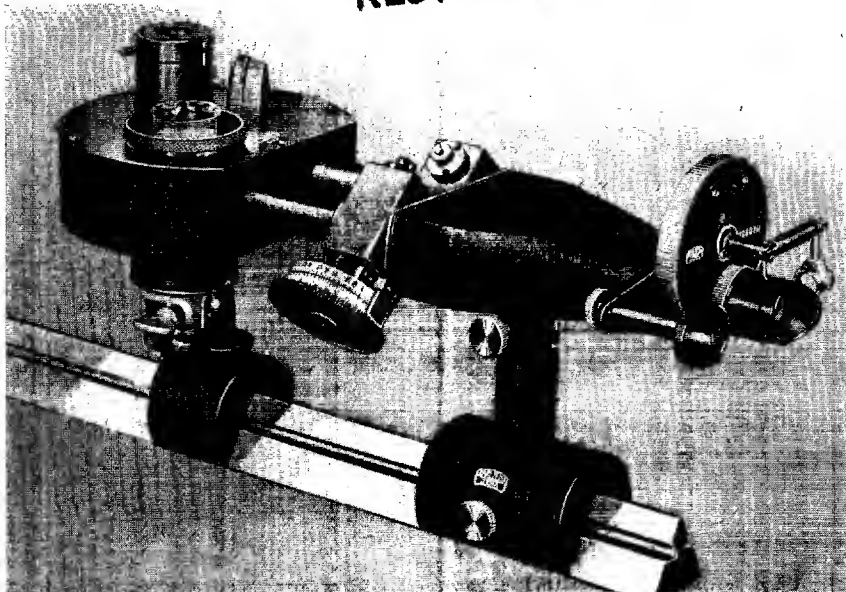


Fig. 19 (about  $\frac{1}{10}$  actual size)

320019

## Pulfrich Photometer (Equipment III b/4)

for both turbidity and fluorescence measurements

Fitted with the corresponding supplementary attachment this equipment is used by

**Chemical, Physico-chemical and Biological Institutes,  
Serological Laboratories and Research Institutes,  
Clinical and Pharmaceutical Institutes,**

**Water Testing and Food Control Offices  
Industrial Research Laboratories**

for:

nephelometric determinations of colloid sols (emulsions and suspensions) and ferments, continuous observation and measurement of reactions of turbidity and precipitation in medicine and chemistry, fluorometric determination of concentrations and fluorescence measurements of liquids.

**Pulfrich Photometer, Equipment III b/4**  
for the measurement of turbid and fluorescent substances in transmitted light, operating on 220 V. a. c.

Order number	Code word
32 50 31	Ukuok

*Apply for particulars*



RESTRICTED

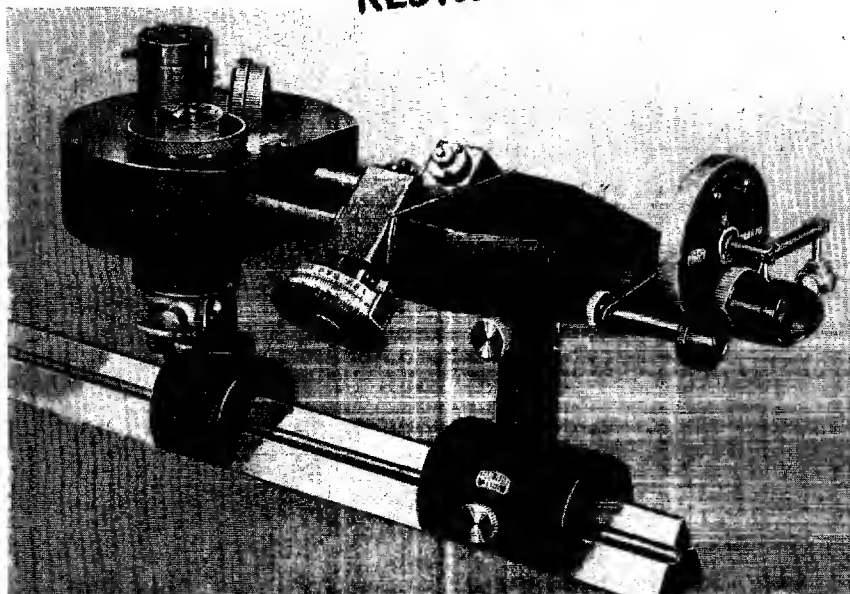


Fig. 19 (about  $\frac{1}{10}$  actual size)

320019

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Industrial Research Laboratories**

for:

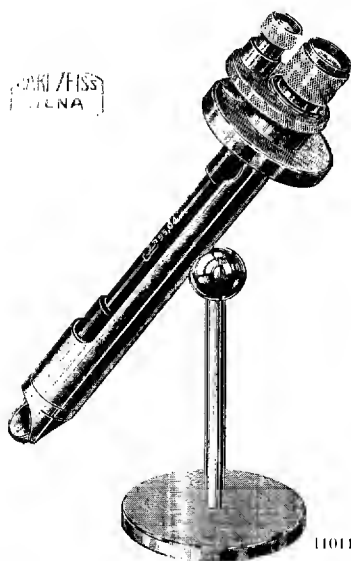
nephelometric determinations of colloid sols (emulsions and suspensions) and ferments, continuous observation and measurement of reactions of turbidity and precipitation in medicine and chemistry, fluorometric determination of concentrations and fluorescence measurements of liquids.

**Pulfrich Photometer, Equipment III b/4**  
for the measurement of turbid and fluorescent substances in transmitted light, operating on 220 V. a. c.

Order number	Code word
32 50 31	Ukuok

Apply for particulars

**RESTRICTED**



## Pocket Polarimeter

110119

Fig. 20 (about 2/3 th actual size)

For the quantitative determination of sugar and albumen in urine. Its construction and handiness are specifically suited for the requirements of the practising physician as well as clinics and hospitals.

**Tolerance:**  $\pm 0.05^\circ$   $0.1\%$

**Pocket Polarimeter**  
with observation tube 95.04 mm. in wooden case

Order number	Code word
32 65 00	Uhyth

*For particulars cf. booklet "32-57.5-1"*

**ZEISS**

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Punktal and Umbral Spectacle Lenses · Contact Lenses · Telescopic Spectacles

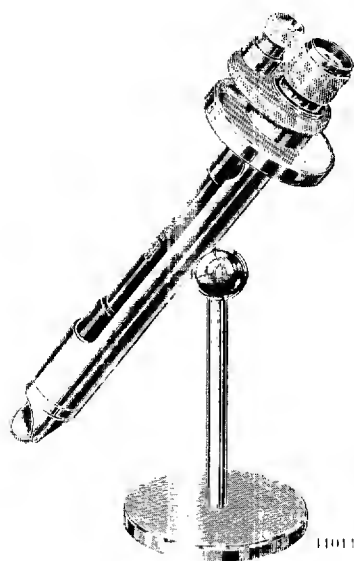


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Please refer overleaf for a review  
of our manufacturing range.

Approved For Release 2001/12/05 : CIA-RDP83-00415R006200110008-2



## Pocket Polarimeter

Fig. 20 (about 1/3 actual size)

For the quantitative determination of sugar and albumen in urine. Its construction and handiness are specifically suited for the requirements of the practising physician as well as clinics and hospitals.

Tolerance:  $\pm 0.05^\circ$  to  $\pm 0.1^\circ$

**Pocket Polarimeter**  
with observation tube 25.04 mm in wooden case

Order number	Code word
32 65 00	Uhyth

For particulars see booklet "32-65-1"